



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/804,082	03/12/2001	Arthur Abnous	13448US02	9106

23363 7590 01/10/2006

CHRISTIE, PARKER & HALE, LLP  
PO BOX 7068  
PASADENA, CA 91109-7068

EXAMINER
----------

CORRIELUS, JEAN B

ART UNIT	PAPER NUMBER
----------	--------------

2637

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/804,082	<b>Applicant(s)</b> ABNOUS ET AL.	
	<b>Examiner</b> Jean B Corrielus	<b>Art Unit</b> 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8, 11, 12, 14 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8 is/are allowed.
- 6) ☒ Claim(s) 11, 14 and 15 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Please update the status of the related applications mentioned in the specification

### *Allowable Subject Matter*

2. The indicated allowability of claims 11, 14 and 15 is withdrawn in view of the newly discovered reference(s) to Strolle et al US patent No. 5,757,855, Shanbhag US patent No. 5,745,396 and Betts US patent No. 5,559,835. Rejections based on the newly cited reference(s) follow.

### *Claim Objections*

3. Note that the previous objection to claims 1, 3-6 and 8 is withdrawn. However after further consideration a new claim objection follows.

Claims 2, 7, 11, 12, 14 and 15 are objected to because of the following informalities:

Claim 2 recites "the symbol decoder corresponds to a trellis code" however, it is noted that "symbol decoder" can't technologically correspond to "a trellis code" because "a symbol decoder" is a **circuit** while "a trellis code" is a "**signal**".

Claim 7, line 3, "a" should be replaced by "said" so as to make use of antecedent in claim 1.

Claim 11, line 1, what does "for corporation" mean? In order to improve the claim language, such limitation should be replaced by an alternate language. Lines 1-3, recite "a symbol decoder" and "Viterbi decoder". Such limitation is not consistent with the specification and the drawing that teaches the "Viterbi decoder" as an example of "symbol decoder". The claim language suggest that there are two decoders while in fact only one decoder is used. The claim should be amended either recites "a viterbi decoder", "a symbol decoder" or "a symbol decoder implemented as a Viterbi decoder". In addition, the claim is an apparatus claim and should therefore recites physical components associated with the apparatus accordingly line 6, reciting plural outputs to be delivered, should be amended to recite for example "an output circuit coupled to the circuitry to provide plural outputs..." note that similar comment applies to similar limitation recited in claim 14 and 15, respectively.

Claim 12, line 2, "said" should be inserted before "intermediate".

As per claim 14, does the limitation "plural outputs" include "the select symbol inputs", recited in line 5? If so line 6 should be further amended to refer to "the selected symbol inputs".

Note that any claim whose base claim is objected is likewise objected.  
Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

Art Unit: 2637

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Strolle et al US patent No. 5,757,855 in view of Shanbhag US patent No. 5,745,396 and further in view of Amrany US patent No. 5,384,810.

Strolle discloses an apparatus figs. 1 and 2 comprising a DFE 60 considered as the claimed "circuitry" operable to receive an output signal from register 54 considered as the claimed "intermediate decisions" and "signals" from a selector 59 considered as the claimed "select signals" from the Viterbi decoder 50 to generate an "input" for an adder 40 considered as the claimed "next-cycle input sample". However, Strolle does not teach the use of a look ahead computation and it fails to teach plural outputs are buffered in a delay element and to be delivered to a decoder. However, the use of a look ahead computation is old and well established in the art for instance, Shanbhag teaches the use of look ahead computations in an IIR filter see fig. 4. Given that fact, it would have been obvious to one skilled in the art to use the look ahead computations in Strolle so as to improve computational speeds as taught by Strolle see col. 2, line 30. Furthermore, Amrany discloses a circuit fig. 3 comprising plural outputs (166-168) to be delivered to a symbol decoder 140, wherein the respective outputs are buffered in delay elements 185. Given that fact, it would have been obvious to one skilled in the art to

incorporate such a teaching in Strolle and Shanbhag so as to provide the apparatus with the circuitry necessary to decode and recover the originally transmitted signal. Finally, it would have been obvious to one skill in the art at the time of the invention to implement the apparatus as multiple decision feedback equalizer so as to enhance system performance.

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Strolle et al US patent No. 5,757,855 in view of Amrany US patent No. 5,384,810.

Strolle discloses an apparatus figs. 1 and 2 comprising a DFE 60 considered as the claimed "circuitry" operable to receive an output signal from register 54 considered as the claimed "symbol outputs" and select a survivor sequence (note that a sequence includes a plurality of symbols) see col. 9, line 18 and lines 35-36 to generate an "input" for an adder 40 considered as the claimed "input symbols" from a set of possible values. However, Strolle does not teach plural outputs are buffered in a delay elements and to be delivered to a decoder and that it also fails to teach that the circuit is a MDFE circuit. Amrany discloses a circuit fig. 3 comprising plural outputs (166-168) to be delivered to a symbol decoder 140, wherein the respective outputs are buffered in delay elements 185. Given that fact, it would have been obvious to one skill in the art to incorporate such a teaching in Strolle so as to provide the apparatus with the circuitry necessary to decode and recover the originally transmitted signal. Finally, it would have been obvious to one skill in the art at the time of the invention to implement the

apparatus as multiple decision feedback equalizer so as to enhance system performance.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amrany US patent No. 5,384,810 in view of Betts US Patent No. 5,559,835.

Amrany discloses a circuit fig. 3 comprising plural outputs (166-168) to be delivered to a symbol decoder 140, wherein the respective outputs are buffered in delay elements 185; a plurality of slicers 165 to provide intermediate decisions (171-173) and path select signals see output of path metric 175. However, Amrany does not explicitly teach that the device is a decision feedback equalizer. It also fails to teach that the slicers are configured to produce "select signals". Betts teaches a circuit fig. 9 comprising a plurality of slicers configure to generate "select signal" at the output of the multiplexer 126. Given that fact, it would have been obvious to one skill in the art to modify Amrany slicers so as to produce "select signals" in order to provide indication of the original subset signal so as to recover the originally provided data stream see Betts col. 6, lines 42-46. Furthermore, it would have been obvious to one skill in the art at the time of the invention to implement the apparatus as multiple decision feedback equalizer so as to enhance system performance.

***Allowable Subject Matter***

8. Claims 1-8 are allowed. However, the claim(s) must be amended if necessary to overcome any objection set forth above.


Art Unit: 2637

9. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean B Corrielus  
Primary Examiner  
Art Unit 2637  
1-6-06